CLAIMS

What is claimed is:

1. A machine programming and control system **(130)** including means for editing and generating **(142)** a continuous multi-block flowchart representing a program for controlling the operations of a machine **(140)**, means **(136)** for displaying the flowchart, continuous and contiguous portions of the flowchart containing more than one flowchart block being displayed, means for directly compiling **(148)** the program from the flowchart, and means for executing **(144)** the compiled program represented by the flowchart such that the machine is controlled in accordance with a displayed flowchart, comprising:

a computer **(132)** including means for editing and generating **(142)** a continuous multi-block flowchart representing a program for controlling the operations of a machine **(140)** connected to said computer; and

a display means **(136)** connected to said means for editing and generating **(142)** and including a screen **(150, 152)** divided into a plurality of columns **(154)** and rows **(156)** for displaying the flowchart with each block of a plurality of blocks **(158, 160, 162)** being positioned at an associated intersection of one of said columns and one of said rows.

2. The system **(130)** according to claim 1 wherein said columns **(154)** are displayed by said display means **(136)** with a width automatically determined by said computer **(132)** according to a size and spacing of said blocks **(158, 160, 162)**.

3. The system **(130)** according to claim 1 wherein said rows **(156)** are displayed by said display means **(136)** with a height automatically determined by said computer **(132)** according to a size and spacing of said blocks **(158, 160, 162)**.

4. The system **(130)** according to claim 1 wherein said computer **(132)** automatically generates high level source code for the program from the flowchart.

5. The system **(130)** according to claim 1 wherein said computer **(132)** automatically draws a connecting line between two associated ones of said blocks **(158, 160, 162)** after editing.

6. The system **(130)** according to claim 1 wherein said computer **(132)** causes said display means **(136)** to display said blocks **(158, 160, 162)** with a first color and display a selected one of said blocks with a second color.

7. The system **(130)** according to claim 1 wherein said computer **(132)** causes said display means **(136)** to display all of said blocks **(158, 160, 162)** dependent from said selected one of said blocks with a third color.

8. The system **(130)** according to claim 1 wherein said computer **(132)** causes said display means **(136)** to display a split screen **(164)** having two portions **(166, 168)** and selectively displaying said blocks **(158, 160, 162)** in at least one of said portions.

9. The system **(130)** according to claim 1 wherein said computer **(132)** causes said display means **(136)** to form a debugging window **(170)** for displaying said blocks **(158, 160, 162)** and having a tool bar **(172)** for controlling program flow.

10. The system **(130)** according to claim 1 wherein said tool bar **(172)** includes a Toggle Labels button **(176)** and said computer **(132)** responds to actuation of said button for switching between default labels and alternate labels displayed for said blocks **(158, 160, 162)**.

11. The system **(130)** according to claim 1 wherein said tool bar **(172)** includes a Select Active Block button **(178)** and said computer **(132)** responds to actuation of said button for displaying a currently active one of said blocks **(158, 160, 162)**.

12. The system **(130)** according to claim 1 wherein said tool bar **(172)** includes an Insert/Remove breakpoint button **(182)** and said computer **(132)** responds to actuation of said button for displaying a currently active one of said blocks **(158, 160, 162)** in a predetermined color and stopping execution of the program before executing said currently active block.

13. The system **(130)** according to claim 13 wherein when the program reaches one of said blocks **(158, 160, 162)** having a breakpoint, said computer **(132)** responds by changing said predetermined color to another predetermined color.

14. A method of machine programming and control including editing and generating a continuous multi-block flowchart representing a program for controlling the operations of a machine, displaying the flowchart, continuous and contiguous portions of the flowchart containing more than one flowchart block being displayed, directly compiling the program from the flowchart, and executing the compiled program represented by the flowchart such that the machine is controlled in accordance with a displayed flowchart, the method comprising the steps of:

a. providing a computer **(132)** including means for editing and generating **(142)** a continuous multi-block flowchart representing a program for controlling the operations of a machine **(140)** connected to the computer;

b. providing a display means **(136)** connected to the means for editing and generating **(142)**; and

c. displaying a screen **(150, 152)** on the display means **(136)** divided into a plurality of columns **(154)** and rows **(156)** for displaying the flowchart with each block of a plurality of blocks **(158, 160, 162)** being positioned at an associated intersection of one of said columns and one of said rows.

15. The method according to claim 14 including displaying said columns **(154)** with a width automatically determined by the computer **(132)** according to a size and spacing of the blocks **(158, 160, 162)**.

16. The method according to claim 14 including displaying said rows **(156)** with a height automatically determined by the computer **(132)** according to a size and spacing of the blocks **(158, 160, 162)**.

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